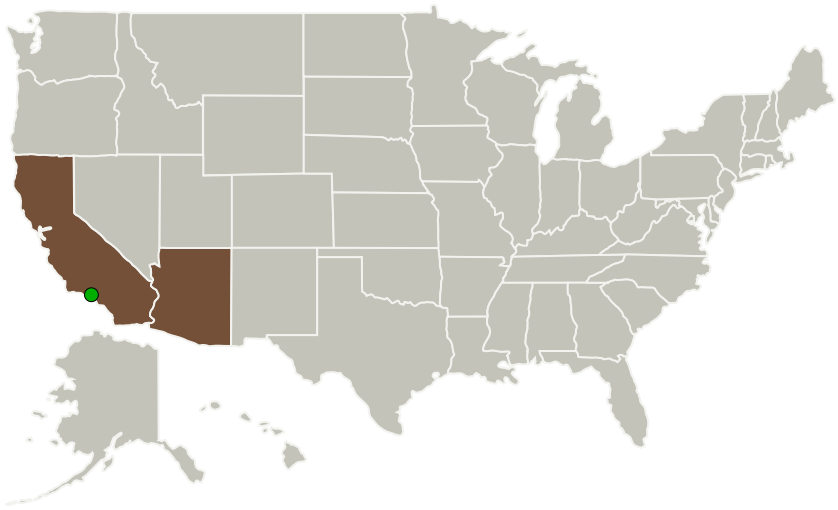
High-speed Pulsed Raman (HiPuR) for Identification of Minerals and Organics

Completed Technology Project (2015 - 2018)

Project Introduction

We propose a miniaturized High-speed Pulsed Raman (HiPuR) spectrometer for planetary surface exploration. The key development under the proposed work is the implementation of new laser technology that has only recently become possible, making use of pulsed MHz microchip lasers with Semiconductor Saturable Absorber Mirrors (SESAMs). These new lasers will be paired with our custom Single Photon Avalanche Diode (SPAD) detector arrays to achieve Raman spectra with over an order of magnitude higher signal-to-noise than achievable with the state of the art (using commercial pulsed microchip lasers) as well as improved time resolution for rejection of fluorescence from short lifetime organics.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
Arizona	California

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Planetary Instrument Concepts for the Advancement of Solar System Observations

High-speed Pulsed Raman (HiPuR) for Identification of Minerals and Organics

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Project Management

Program Director:

Carolyn R Mercer

Program Manager:

Haris Riris

Principal Investigator:

Jordana Blacksberg

Co-Investigators:

Yuki Maruyama
George R Rossman
Karen R Piggee
Jack D Farmer
Erik L Alerstam

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destination

Others Inside the Solar System